

Installing Vibrating Wire Strain Gages With Screw-On Mounts

For applications on reinforced concrete structures, BDI has developed a mounting system that involves drilling small holes and using masonry screws. This significantly increases ease of installation and reduces time when compared to the standard grouting method. It is also more appropriate than the glue-on technique for applications lasting longer than a couple of weeks or in excessively wet conditions.

- 1) Slide the mount with one set screw only onto the end of the VW strain gage that has the machined “V” groove and snug down the set screw with an allen wrench. Set the gage on a flat surface with the flat side of the mount down, ensuring that the “pinched” section in the middle of the gage is vertical. Slide the other mount (with two set screws) over the other end of the gage, again with the flat side down against the flat surface and snug both set screws. Once the mounts are attached at both ends, be sure to not let them “twist” relative to one another as this can cause damage to the internal vibrating wire.
- 2) Determine the location on the structural member that the gage is to be mounted by holding the gage in position. Mark through each of the four screw holes with a felt pen.
- 3) Remove the gage and drill one of the holes with a hammer drill and a 5/32” concrete drill bit to a depth of approximately 1-1/2”. Wrapping tape around the drill bit at that depth makes a helpful gage.
- 4) Using a battery-operated screw gun, screw the BDI VW Strain Gage Jig in place with one 1-1/4” masonry screw (also referred to as “Tap Cons”), lining up all the holes with the marks previously placed on the member.
- 5) Next, drill another hole through the jig (at the opposite end) and place snug down another screw through the new hole. Drill the remaining two holes and remove the jig. This procedure should ensure that the four screw holes are placed as accurately as possible which is very important.
- 6) Now, set the gage in place and snug up one screw in the mount with the single set screw. **IMPORTANT:** Loosen the set screws on the double-set screw mount, install masonry screws, and snug down. Install last masonry screw through the single screw mount and snug all of them up. The reason for this procedure is to avoid applying longitudinal forces to the strain gage during installation.
- 7) Tighten up all four masonry screws and ensure that the two end mounts are parallel. This is very important as any “twisting” induced in the gage can cause malfunctions.
- 8) Place the “plucker” unit over the center of the strain gage and use the provided hose clamp to hold it in place. Fully tighten the set screw in the mount with one set screw only. If you are going to “pre-load” the gage either in tension or compression, loosen the set screws in the other mount and adjust accordingly. Tighten the two set screws. Double-check the reading with the VW readout box to make sure the gage is in working order and is giving valid readings for both strain and temperature.
- 9) The holes for the gage covers can now be drilled and the BDI aluminum covers bolted in place.

It should be possible to mount each strain gage in approximately ten to fifteen minutes. When the testing is completed, *carefully* loosen the gage from the mounts with the appropriate allen wrench and unscrew the mounts.